

being very much greater than that on the day in May—three times as great—indicating in a short time a seasonal change that seems to require further observation to confirm. The material is insufficient for much to be said as regards diurnal variation of horizontal force.

Dr. Chree adds the remark that though at first sight the changes in declination seem quite out of proportion to the changes of the force, this is not really the case, but that, as a matter of fact, the changes in direction and intensity are occasioned by disturbing forces which are of the same order of magnitude. He makes some comparison also with results found in the *Erebus* and *Terror* voyage.

There are notes of aurora. On one occasion, May 30, 1899, it is remarked that the movement of the magnet was most conspicuous during the active time of the aurora. Dr. Chree adds that many of the observations were taken in disadvantageous circumstances, and with a limited instrumental outfit, so that some of the conclusions arrived at should be accepted with reserve, at the same time remarking that the zeal and care of the observers under physical discomfort seemed to merit this attempt to do full justice to their work which, it is thought, might help to direct attention to special points of inquiry as regards other expeditions setting out, or likely so to do.

The meteorological results include a daily record of barometric pressure, air temperature, depression of wet bulb, direction and force of wind, character and amount of cloud, bright sunshine and precipitation, from March, 1899, to January, 1900, the observations (excepting of the last two mentioned elements) being taken at intervals of two hours day and night in the months of June and July, and in the remaining months at intervals of two hours from 9h. a.m. to 9h. p.m., in all cases accompanied by descriptions of weather; there are also various monthly abstracts of meteorological phenomena. Interesting descriptions of the numerous appearances of aurora are given, but whether synchronising or not with unusual magnetic motion does not directly appear, excepting on the one occasion already mentioned. The meteorological section is preceded by an introduction by M. Bernacchi explanatory of various matters, at the end of which he says it is of course premature to attempt to give a truly satisfactory description of the prevailing winds and temperature conditions in high southern latitudes until one year's observations at numerous stations on Antarctic lands are obtained, but expresses the hope that the Cape Adare observations may yet make our knowledge of the region less hypothetical than before.

NOTES.

THE death is announced, in his eightieth year, of Prof. Julius Victor Carus, professor of zoology in Leipzig.

THE German Association of Naturalists and Physicians will hold its seventy-fifth annual meeting this year at Cassel, on September 20-26.

THE annual meeting and conversazione of the Selborne Society will be held on Tuesday, May 5. The president, Lord Avebury, will occupy the chair.

AN international agricultural conference will be opened at Rome on April 13. Sir Thomas Elliott, secretary to the Board of Agriculture, will represent the Board at the conference.

LORD BLYTHSWOOD has been elected a member of the Athenæum Club under the rule which empowers the annual election by the committee of nine persons "of distinguished

eminence in science, literature, the arts, or for public services."

THE University of Toronto has, *Science* reports, received subscriptions amounting to 6000l. toward a convocation hall, of which sum Mr. Chester Macy has given 1000l., and Prof. and Mrs. Goldwin Smith 400l.

THE following are the subjects of lectures arranged for the Wednesday evening meetings of the Society of Arts after Easter:—"Modern Bee-Keeping," by Mr. W. F. Reid; "Automatic Wagon Couplings," by Mr. T. A. Brockelbank; "The Construction of Maps and Charts," by Mr. G. T. Morrison; and "Preservation of Big Game in Africa," by Mr. E. North Buxton.

THE Carnegie Institution has granted 1200l. to be expended under the direction of Dr. T. C. Chamberlin, of the University of Chicago, in research relative to fundamental problems in geology. The Institution has also made a grant to Dr. J. E. Duerden, late curator of the Jamaica Museum, to assist him in his work on the morphology of recent and fossil corals.

THE council of the Geologists' Association has arranged an excursion for April 18 to New Cross to examine the reopened cutting south of the L.B. and S.C.R. station, which shows the junction of the London Clay and the beds below. This interesting section will be hidden again shortly, and geologists who have not yet examined it will be glad to hear of the excursion, the details of which were arranged too late for insertion in the April circular of the Association.

REPLYING in the House of Commons to a question by Mr. Schwann asking what is the present position of Mr. Jamsetjee N. Tata's scheme for a scientific research institution in India, and what support has been given to the scheme by the Government of India, Lord George Hamilton, the Secretary of State for India, said that he understood that Mr. Tata's scheme for a scientific institution is in abeyance for a time.

A MINERAL survey of Ceylon has been commenced with Mr. A. K. Coomaraswamy as director, and Mr. J. Parsons as assistant. It is intended to carry on investigations for three years, the results afterwards to be embodied in a report on the mineral resources of the island. Chemical work in connection with the survey will be carried out at the Imperial Institute, South Kensington. The headquarters of the survey are for the present to be at Peradeniya.

A CORRESPONDENT of the *Lancet* reports that Mr. Henry Phipps is so pleased with the purposes to which the Viceroy decided to devote his donation of 20,000l., viz. between a central agricultural laboratory and a Pasteur institute for southern India, that he has increased his gift by another 10,000l. The Government of India hopes to be able to carry out measures for combining agricultural education, scientific research, and practical experiment in one locality.

THE Paris correspondent of the *Times* announces that Dr. Roux, of the Pasteur Institute, has been awarded the Prix Osiris of 100,000 francs by the Institute of France. We learn from the same source that the prize owes its existence to the generosity of M. Osiris, and is now awarded for the first time. It has been founded as a stimulus to original discovery and valuable work in the domain of science, art and letters. In unanimously deciding to give the prize to Dr. Roux, the Institute of France has recognised the high value of his scientific labours in preventive medicine and bacteriology.

THE Elliott prize for scientific research will be given this year, the *Pioneer Mail* announces, to the author of the best original essay composed during the year 1903 giving the results of original research or investigation by the essayist on chemistry. Any native of Bengal, including any Eurasian or domiciled European residing in Bengal, may compete for the prize. Essays of competitors must be sent in to the president of the Bengal Asiatic Society by the end of December, 1903. Preference will be given to researches leading to discoveries likely to develop the industrial resources of Bengal.

THE following earthquakes have been reported within the last week:—April 3.—Several earthquake tremors, two of them alarmingly violent, have occurred during the last three days, in the Andijan region. Similar shocks have been felt contemporaneously in the Southern Urals. April 4.—Violent shocks of earthquake are reported from various parts of the province of Catania. A shock of earthquake was felt at 2 a.m. at Mentone. Houses were shaken. There was no recurrence of the shock, which only lasted half a second.

A NEW turbine steamer was launched at Dumbarton from the yard of Messrs. Denny Bros., on April 4, for the Cross-Channel service of the South-Eastern and Chatham Railway. The new vessel is of the same type, though larger, as the vessels which have been successful on the Clyde. The machinery will consist of Parsons's turbines, three being fitted, with three lines of shafting. In manœuvring, the centre shaft runs free, and the two side shafts then take the place of ordinary twin screws. The builders have undertaken that this vessel shall have an average sea speed of 21 knots, and it is expected that the vessel will perform the voyage from Dover to Calais in forty-five to fifty minutes.

REUTER'S Agency is informed that Dr. T. Rubin, of Upsala, the leader of the scientific expedition which has been dispatched to Africa by the British South Africa Company, has left England. He was accompanied by Dr. Stoehr, the medical officer. After conferring with Sir David Gill, the Astronomer Royal at Cape Town, Dr. Rubin and the other members of the expedition, who will join him in South Africa, will leave for Chinde *en route* for Fort Jameson. He will then confer with the Administrator of North-East Rhodesia, and at once proceed to the work of the geodetic survey.

THE *Geographical Journal* announces further details of the programme of the International Geological Congress to be held in Vienna in August next. There will be discussions on overfolded or overthrust planes relating to the structure of the mountains of Scotland, the Jura, and the Alps. A special sitting will be devoted to questions concerning the geology of the Balkan Peninsula and the East. The surface geology of the town of Vienna will also be discussed. The extensive engineering works carried out in the neighbourhood during the last ten years have exposed many deposits which have led to important discoveries by Prof. Suess. A paper on the subject will be illustrated by a large geological map on a scale of 1 : 10,000, and numerous sections.

THE Board of Trade has informed the secretary of the Engineering Standards Committee that the sum of 3000*l.* has been included in the Board of Trade vote, for 1903-4, as a contribution towards the funds of the Engineering Standards Committee for that year only, on the understanding that the Treasury is not thereby pledged to continue the grant in later years. The actual expenditure under the vote will have to be authorised by the Railway Department

of the Board of Trade on the recommendation of a committee specially appointed for the purpose by the Institution of Civil Engineers. The committee appointed by the Institution includes:—the president and the senior vice-president of the Institution of Civil Engineers; Mr. James Mansergh, F.R.S., Sir John Wolfe Barry, K.C.B., Sir William Preece, K.C.B., Sir Benjamin Baker, K.C.B., and Sir Douglas Fox, past presidents of the Institution; Mr. Archibald Denny; with a representative of the Board of Trade.

THE spring meeting of the Institution of Naval Architects was held in the rooms of the Society of Arts last week, when the annual report of the council was presented, and new officers were elected. The report states that a committee of the council has, during the past year, been considering the possibility of raising a fund for the construction of an experimental tank at Bushey, in connection with the National Physical Laboratory there, in accordance with the resolution passed at the summer meeting held in Glasgow in 1901. The proposal is still under consideration. A cordial invitation from the Lord Mayor of Belfast (Sir Daniel Dixon) to hold a summer meeting in that city has been accepted by the council, and a further invitation, to include a visit to Dublin, has been received from the president of the Institution of Civil Engineers of Ireland (Mr. J. H. Ryan), and has also been accepted. A gold medal of the Institution has been awarded to Captain G. Russo, R.I.N., for his paper on the navipendular method of experiments as applied to some warships of different classes, and a gold medal to Prof. S. Dunkerley, for his paper on the straining actions on the different parts of a crank shaft. Among the numerous papers read during the three days of the meeting the following may be mentioned:—On the effect of modern accessories on the size and cost of warships, Mr. W. H. Whiting; on the lines of fast cruisers, Vice-Admiral C. C. P. FitzGerald; the training of engineers in the United States, Prof. W. E. Dalby; the modification of the mean pitch due to twisting the blades in screw propellers, Prof. Angelo Scribanti; the screw as a means of propulsion for shallow draft vessels, Mr. A. F. Yarrow; marine installations for the carriage of refrigerated cargoes, Mr. R. Balfour; and the corrosion of metal pipes on board ship, Mr. A. W. Stewart.

A DEMONSTRATION of the Orling-Armstrong system of wireless telegraphy and telephony was given at the Alexandra Palace on Thursday last. We have already referred to this system on several occasions in *NATURE*, and described the capillary relay which is used as a receiver some time ago. The transmitter is so connected that both the primary and secondary circuits of the induction coil are simultaneously earthed, a combination which it is claimed produces remarkable effects. An experiment was shown in which two bombs were exploded at a distance of three or four hundred yards, the earths of the transmitter being about one hundred yards apart; either bomb could be exploded at will, the receiving circuit of each being syntonised to a different period. Syntonisation is effected with a telephonic receiver which actuates a sensitive flame in a tuned chamber; the flame heats a platinum wire in the relay circuit. Presumably, therefore, it is the period of the interrupter which is syntonised, not the oscillation period of the spark; apart from this objection a sensitive flame does not appear a very practical arrangement. Wireless telephony from a distance was also demonstrated; the received speech was plainly audible, but owing to the fact that a key had to be depressed or released for speaking or listening respectively, conversation was not possible; this is, however, a minor difficulty, which can doubtless be overcome. It is

not easy to see how any widespread extension of telephony of the sort could take place without interference, but possibly the principle may be useful for private isolated installations or military and field work generally.

SIR C. EUAN-SMITH, who presided at the general meeting of Marconi's Wireless Telegraph Co. last week, referred to the wireless telegraph conference which it is proposed should be held in Berlin. He stated that "generally speaking, the company thought that the inauguration of a system intended to be applicable to international wireless communication all over the world, and to be adopted for use by the many more or less imperfect systems of wireless telegraphy in vogue, was fraught with apparently insurmountable difficulties, some of a technical, but others of a business and practical character." They awaited further details of the programme of the conference, however, before forming any definite opinion upon it. Reference was also made to the anticipated arrangement with the Post Office; since that date, according to last Saturday's *St. James's Gazette*, these negotiations have resulted in a further deadlock, the Post Office having imposed conditions which the Company cannot accept. Mr. Marconi also spoke at the meeting at some length, referring mainly to the opposition which his system has met with in the Press; experience had proved, he claimed, that the difficulties, real or imaginary, which had been raised had been overcome one by one, and he hoped that in the near future those still outstanding would likewise be surmounted. Mr. Marconi also spoke of the synony experiments made by Prof. Fleming, which he hoped shortly to repeat before Lord Kelvin and Lord Rayleigh.

PROF. G. P. MERRILL writes from Washington to point out that in the volume entitled "The Elements of Agricultural Geology," by Mr. P. McConnell (Crosby Lockwood and Son), noticed in *NATURE* of November 13, 1902 (p. 31), his work on "Rocks, Rock-Weathering, and Soils" (1897) is misquoted, and he is made responsible for statements which do not appear in the book. Mr. McConnell states (pp. 20-21):—"According to Merrill, the *whole* of the original soil formation of New England has been eroded off by glaciers and dumped into the Atlantic, while a new lot—a mongrel horde—has been brought from the *far* north and laid down." Again, writing of the Huronian formations of the Green Mountains of Vermont, he says (on p. 164):—"As previously stated, an American author holds that the *whole* of the soils originally formed in *this region* have been swept off by glaciers and dumped into the Atlantic." Prof. Merrill informs us that he does not hold and never has held these opinions; and he shows by reference to the original that his words have been misconstrued.

THE opal mining industry of Queensland, by Mr. C. F. V. Jackson, forms the subject of Report No. 177 of the Geological Survey of Queensland (1902). While nearly all varieties of opal are found in the western portion of the country, the examples of precious opal there met with are unsurpassed in quality and brilliancy. These examples are found almost entirely in the Desert Sandstone Series (Upper Cretaceous), which has a thickness of from 100 to 200 feet, and so far they have been discovered only in outlying patches of the formation. The Desert Sandstone consists of soft sandstones and clays with a capping of hard siliceous rock, frequently converted into a porcellanite. This "Top Rock" has, in places, a kind of nodular or spherical structure, and there has apparently been a tendency to the solution and redeposition of its siliceous contents. The surface is

much disintegrated. The precious opal occurs chiefly in the softer beds underlying the "Top Rock," but occasionally it is found in it. Common forms of opal are prevalent, but the precious variety appears only here and there in patches, sometimes in nodules of siliceous ironstone at all horizons, at other times in the false-bedded sandstones and clays in a more definite band. In places, the mineral is found scattered over the surface, being set free by denudation, but such occurrences furnish little or no evidence of precious opal below. Prospecting is a hazardous business, as the site for a shaft is most frequently chosen in the vicinity where scattered specimens have been found at the surface. The average depth of shafts is 14 feet, and the deepest is about 65 feet. The great difficulty in the progress of the industry is the scarcity of water, the annual output, as the author observes, being dependent on the rainfall.

A TREATISE by Dr. E. Mazelle, director of the Trieste Observatory, on the connection between the movements of the microseismic pendulum and meteorological phenomena, was recently submitted to the Vienna Academy by Hofrath Dr. J. Hann. The movements of the instrument exhibit a decided yearly period, a maximum in winter and an almost complete absence of disturbance in summer; also a daily maximum and minimum between 9h. and 10h. in the morning and evening respectively. When submitted to harmonic analysis, the whole-day period exhibits a perfect agreement of the phase epoch with that of the stormy Bora at Trieste. The other relations are not so marked; disturbances occur with both days of high and low barometric pressure, but pronounced disturbances appear to be more probably connected with low pressure. With regard to the possible connection of microseismic disturbances with the state of the sea it was found that these have a greater tendency to occur when the sea is rough. For further details we suggest a reference to the work in question.

DR. T. BYARD COLLINS, writing in the *Scientific American*, describes some experiments on the action of birds' wings. By attaching incandescent lamps to the tips of a pigeon's wing, and inducing the bird to attempt to fly, the path of the tip was found to be an oval curve agreeing fairly well with the results described by Prof. Marey in his "*Vol des Oiseaux*." The author considers that the only way of solving the problem of flight is by beating wings—a method experimented on many years ago by Pénau.

A MAGNETIC survey of the neighbourhood of the summit of the Puy de Dôme has led to some interesting results, which are described in this month's *Journal de Physique* by MM. B. Brunhes and P. David. The declination was found to be nearly normal along a line through the centre of the tower, 15° west of north, and it varied from 10° 5' at 200 metres east of the tower, 80 metres lower than the summit, to 19° 45' at 300 metres from the tower, 150 metres below the summit. The horizontal component varied from 0.193 of a C.G.S. unit at 100 metres from the tower in a direction 15° west of north to 0.225 of a C.G.S. unit at 156 metres south of the tower. A diagram of the disturbing force shows that it is directed towards the summit, but not quite uniformly in different directions.

In the West Indian *Agricultural News* for March 14 there is a descriptive account of experiments which have been commenced on the Island of St. Vincent with the view of testing the possibility of starting cultivation, with certain plants, on estates which are buried under from nine to ten inches of volcanic ash, resulting from the severe eruptions of the Soufrière in May, September and October, 1902. The plants selected for the experiments are sugar-cane (five

varieties), cotton, ground-nuts, arrowroot and sweet potato. The experiments were started in January, and valuable results were expected, "provided there are no further eruptions." It is to be feared, therefore, that the great quantity of ash thrown out from the Soufrière during the eruption of March 22 last will greatly interfere with the interesting investigation.

THE Imperial Department of Agriculture at Barbados has just issued a report giving "Information relating to Cotton Cultivation in the West Indies." Formerly the islands had a valuable export trade in cotton, in 1793 contributing 71 per cent. of the material used in Great Britain, but sugar became paramount, and for about three-quarters of a century past cotton has been practically unknown in the islands. Now that sugar has become to a large extent unprofitable, it is proposed to resuscitate the cotton-growing industry. The department commenced experiments in St. Lucia in 1900, and the results obtained have been so promising that planters there and in neighbouring islands have already devoted about 600 acres to the growth of cotton. So favourable are the conditions that it is stated "the days of the more lucrative production of sugar would appear to have passed away, and it is not improbable but that cotton may once more take its place amongst the staple products of the West Indies."

WE have received an official note issued by the Commission of the *Belgica* with reference to the publication of the scientific reports of the expedition. These are to be issued in parts, making ten volumes in all. Only fifty complete sets will be on sale to the public. The English agents are Messrs. Dulau and Co.

M. CHARLES RABOT contributes an interesting paper on the recent surveys and explorations of MM. Svenonius and Hamberg in Swedish Lapland to the March number of *La Géographie*. Topographical surveys have resulted in important modifications of existing maps, and the region is of great geological interest.

THE *National Geographic Magazine* for March contains three articles of considerable interest in relation to the question of the Canadian-Alaskan boundary. The Hon. John W. Foster, who has charge of the presentation of the United States case to the Boundary Commission, reviews the methods by which different parts of the boundary between Canada and the United States have been adjusted since 1783. Mr. Ferdinand Westdahl, of the Coast and Geodetic Survey, gives extracts from his official reports on a survey of the mountains of Unimak Island, Alaska; and an article on the opening of the Alaskan Territory, by Mr. Harrington Emerson, is reprinted in abstract from the *Engineering Magazine*.

THE Foraminifera and other organisms in the Raised Reefs of Fiji are described by Mr. R. L. Sherlock (*Bull. Museum of Comp. Zool. Harvard College*, vol. xxxviii. 1903).

WE have received the first number of the "Naturalist's Library Guide," a quarterly journal edited by Mr. W. P. Westell, devoted to notices and brief reviews of books and other publications connected with natural history.

AMONG other zoological papers, the *Sitzungsberichte* of the Royal Scientific Society of Bohemia contains one by Dr. J. Palací on the distribution of marsupials, and a second, by Dr. H. Matiegka, on the weight of the brain and cranial capacity in man. Much interest attaches to Herr A. Mrázek's account of the discovery of a fresh-water nemertine worm (*Stichostomma graecense*) in Bohemian streams.

This paper is followed by a second from the same pen on the introduced faunas of hot-houses.

IN his report on the Zoological Gardens at Giza, Cairo, Captain Flower calls special attention to three specimens of that remarkable bird the shoebill, or whale-headed stork (*Balaeniceps rex*), now living in the gardens. With the exception of one specimen, now at Khartum, no other examples, it is believed, have been exhibited in captivity since the pair purchased for its menagerie by the Zoological Society of London in 1860. During the past year an aquarium was opened at Gezira, and contained at the date of the report examples of no less than twenty-two species of Nile fishes.

"FAMILIAR WILD BIRDS" is the title of a new illustrated work of which we have received the first part from the publishers, Messrs. Cassell and Co., Ltd. It is to be issued in fortnightly sixpenny parts, each of which is to have eight coloured plates. Mr. W. Swaysland is responsible for the greater portion of the text, although Mr. R. Kearton will communicate notes on eggs. The great attraction will be the coloured plates, most of which are to be from sketches by Mr. A. Thorburn. Those in the part before us are really exquisite, and the marvel is how the work is produced at the price.

Pearson's Magazine for April contains two articles, both illustrated, on natural history subjects. In the one Mr. H. F. Witherby describes some of the leading facts connected with bird-migration, in the course of which he draws attention to the important work on this subject carried out by Mr. W. E. Clarke, and likewise points out that it is an error to suppose that the migration routes are narrow. The illustrations include the Nore lightship in the midst of a migratory host, and a "rush" of birds against a lighthouse. It is perhaps not generally known that when such "rushes" take place in stormy weather thousands of birds perish by striking against the lighthouses. On one occasion "the balcony outside was completely covered with killed birds; they were five or six deep all round, so to walk round would be walking on killed birds." In the second article Mr. R. L. Garner reverts to his favourite subject of "monkey-language." From experiments conducted with a phonograph, the author is of opinion that monkeys understand this language as well as human beings interpret words and sentences.

OUR best congratulations to the Ulster Fisheries and Biological Association, which was inaugurated at a meeting held in Belfast on March 25, when Lord Shaftesbury, the patron of the new body, was in the chair. The president is Mr. H. H. Smiley, who is a large contributor to the funds, and the Association is fortunate in having secured the gratuitous services of Prof. G. Wilson, of Queen's College, Belfast, as Director, since that gentleman acquired a large experience in matters of this sort during his tenure of office as Inspector of Fisheries in England. It is expected that the Association will have an important influence on the development of Irish sea-fisheries, which have hitherto been somewhat neglected, as may be judged from the fact that most of the fresh fish sold in Ireland is imported from Great Britain. A steam launch has been already secured, and it is hoped that practical work may be commenced in Larne Harbour forthwith. Although the Department of Technical Instruction and Agriculture has promised a grant of 150l., the Association is in urgent need of additional funds.

THE sixth edition of Prof. R. Frühling's "Anleitung zur Untersuchung der für die Zuckerindustrie in betracht

kommenen Rohmaterialien, Produkte, Nebenprodukte und Hilfssubstanzen" has been published by Messrs. Vieweg and Son, Brunswick. The work is a standard one on sugar from the point of view of the technical chemist, and the new edition contains several additions which increase its value.

MESSRS. VIEWEG AND SON, of Brunswick, have issued the third edition of Dr. Robert Fricke's treatise on the calculus and differential equations ("Hauptsätze der Differential und Integralrechnung"). It is written primarily for use in technical schools, but it contains in the compass of 218 pages the principal subject-matter commonly studied by the average mathematical student, including an appendix on functions of complex variables.

MESSRS. J. AND A. CHURCHILL have published a sixth edition of "Quantitative Chemical Analysis," by Dr. Frank Clowes and Mr. J. B. Coleman. This edition differs from the last in that the section on organic chemistry has been revised, and processes for determining molecular weight by elevation of boiling point and for the analysis of aluminium alloys have been added. Moreover, to facilitate necessary calculations, tables of four-figure logarithms have been added.

THE first number of a new illustrated magazine dealing with scientific subjects, and called *La Science au XX^e Siècle*, has appeared. The magazine is published in Paris, under the editorship of M. G. Maneuvrier, by M. Ch. Delagrave. Judging by the contents of this issue, the new journal should be popular; there are, with others, articles on Mont Pelée, on wireless telegraphy, and on the scientific work of M. P.-P. Dehérain. Attention is also given to the experimental teaching of science in schools, several experiments suitable for school laboratories being described. Applied science receives due attention, and separate sections are devoted to zoology, applied chemistry, botany, physics and photography.

PROF. H. H. TURNER, Savilian professor of astronomy in the University of Oxford, contributes to the *Fortnightly Review* for April a reply to Dr. Wallace's article on "Man's Place in the Universe" which was published in the same review last month. Dr. Wallace suggested that the universe is limited in extent; that it has a definite centre at which the solar system is, and has been situated for millions of years; and that by reason of its position the earth has had an opportunity to develop humanity, and probably this opportunity has been nowhere else in the universe. Prof. Turner shows that the limitation of the universe is not proved; that there is no true centre of the universe, even if limited, and even if there were the solar system could not occupy it for long, on account of the sun's proper motion; he also shows that there is no reason whatever why life should not be developed in any part of the interior of even a limited universe.

THE new issue, the fortieth, of "The Statesman's Year-Book," edited by Dr. Scott Keltie, is conspicuous for its exhaustive completeness. An examination of its contents suggests that similar annual compilations dealing respectively with the data of each of the great divisions of science would be of great value to men of science everywhere. Dr. Keltie points out that recent important events have necessitated the addition of much further information. Among these occurrences may be mentioned the final incorporation of the two South African Republics in the British Empire, and the passing of the new Education Act. Further details have been embodied of the recent censuses taken in various countries—the British Empire (especially India), France,

Germany, and the United States. The maps and diagrams, as usual, add greatly to the interest and value of the "Year-Book." There are maps of the new arbitration boundary between Chile and the Argentine Republic, the new Abyssinian boundary, and the transcontinental railway projects. Diagrams exhibit graphically comparative tonnage of merchant shipping belonging to the principal countries for the past twelve years, comparative outputs of iron-ore and of coal of the principal countries for the last twenty years, the public debt of the principal countries in pounds sterling for the past eleven years, and the emigration from the principal countries for the last ten years.

IN following up their researches on chemical affinity at low temperatures, Messrs. Moissan and Dewar describe in the current number of the *Comptes rendus* further experiments on liquid fluorine. Various substances, dried with care, and previously cooled to -190° C. by liquid air with the exclusion of atmospheric moisture, were brought in contact with liquid fluorine also at -190° C. No reaction was observed with iodine, oxygen, tellurium, nitrogen, antimony, carbon, silicon, and boron. On the other hand, sulphur, selenium, phosphorus and arsenic catch fire on contact with the liquid, the reaction with calcium oxide and anthracene being still more violent; potassium, after a short time, gives rise to a violent explosion. It is evident, therefore, that even at this low temperature the forces of chemical affinity are not suspended when so energetic an element as fluorine is concerned.

THE additions to the Zoological Society's Gardens during the past week include a Pinche Monkey (*Midas oedipus*) from Colombia, presented by Mr. A. G. Kemp; a Blood-rumped Parrakeet (*Psephotus haematonotus*) from Australia, presented by Mr. B. C. Thomasset; a Sparrow Hawk (*Accipiter nisus*) from Pekin, presented by Mr. W. R. G. Bond; a Moor Monkey (*Semnopithecus maurus*) from Java, ten Olivaceous Lizards (*Lacerta littoralis*, var. *olivacea*) from the Island of Brazza, deposited; a Bactrian Camel (*Camelus bactrianus*), a Mouflon (*Ovis musimon*), a St. Kilda Sheep (*Ovis aries*, var.), five North African Jackals (*Canis lupaster*), born in the gardens.

OUR ASTRONOMICAL COLUMN.

COMET 1902 d.—Herr F. Ristenpart gives a daily ephemeris for this comet in No. 3853 of the *Astronomische Nachrichten*. The following is an abstract therefrom:—

12h. M.T. Berlin.

Date.	α 1903 ^o	δ 1903.	log r .	log. Δ	Magnitude
	h. m. s.				
April 10	7 6 22.58	+ 30 37 6.7	0.4447	0.4306	11.76
14	7 11 12.85	+ 31 10 38.1	0.4452	0.4395	
18	7 16 20.11	+ 31 41 34.7	0.4458	0.4482	
22	7 21 43.29	+ 32 9 59.6	0.4465	0.4567	
26	7 27 21.62	+ 32 35 57.0	0.4472	0.4650	
30	7 33 13.88	+ 32 59 29.5	0.4481	0.4731	11.94

An observation made by Herr Millosevich on February 21 gave a correction of -0.9 rs., $-59''6$ to this ephemeris.

COMET 1903 a.—The apparent brightness of this comet is now rapidly declining, having reached its maximum value (eighty-two times its brightness when discovered) on March 28. The comet is now too near to the sun in R.A. to be observed, and in any case its great southerly declination would prevent its observation in these latitudes.

An ephemeris published by M. Paul Brück in No. 3851 of the *Astronomische Nachrichten* gives its position for April 13 as $\alpha = 0^h$ 8m. 58s., $\delta = -41^{\circ} 5'6''$, and its brightness as 36, taking its brightness when discovered as unity.